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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/729,006

Applicant(s)

TOYOMURA, FUMITAKA

Examiner

ASHA HALL

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States

2. Claims 1, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Kondo et al. (US 6,169,678).

Kondo et al. discloses solar cell battery arrays comprising at least one power conversion unit (21) (col. 3; lines: 19-29) having a plurality of solar cell elements/solar battery arrays (11) and a power converter (21) for converting DC to AC/inverter power (col. 4; lines: 61-64) provided in a position corresponding to a region surrounded/electrically connected to all the solar cell elements/array (11) (Figure 1).

Claim 13 reads on the power generation unit/solar cell module (11) of Kondo et al. as shown in Figure 1. Kondo et al. discloses a solar cell array (11) comprising at least one having a plurality of solar cell elements/array (11) and a terminal box (21) provided in a position corresponding to a region surrounded/underneath the plane of the plurality of solar cell elements (11) as shown in Figure 4 to collect outputs of the solar cell elements (2) (col.3; lines: 3-29).

In regard to claim 15, Kondo et al. discloses a solar cell module (11) in Figure 1, as comprising at least one power generation unit (21) having two adjacent solar cell elements/array (11) (Figure 4) and a terminal box/power generation unit (21). Kondo et

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al. reads on having the terminal box/power generation unit (21) shown in Figure 1, wherein placed in a region next to the solar battery module/array(11) wherein there is a gap (extension shown by the arrow in Figure 1) between the two adjacent solar cell elements/arrays (11, 12, 13) to collect outputs of the two adjacent solar cell elements (col. 3; lines: 3-29).

3. Claims 1-5, 10-12, 14, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kondo et al. (US 2002/0038667).

With regard to claim 1 and 2, Kondo et al. (US 2002/0038667) discloses the solar cell module (1) (paragraph 1) according to claim 1, wherein at least two of the power conversion units/inverter(21) (paragraph 33) are included and each power converter/inverter unit (3) (paragraph 36) is in the plane of the solar cell module (1) and electrically connected to a power converter of an adjacent power conversion unit (as shown in both Figure 1 & 2).

In respect to claim 3, Kondo et al. discloses that the outputs of the solar cell elements/solar battery unit (2) (as shown in Figure 7) are inputted to the power converters/inverter units (3) (paragraph 33 & 36) corresponding to the solar cell elements (paragraph 36), and the power converters (21) convert the inputted outputs of the solar cell elements(2) and output the converted outputs (paragraph 36 & paragraph 51).

With regard to claim 4, Kondo et al. discloses that all output terminals/output connector (Figure 2) of the solar cell elements (1) are electrically connected (also

shown in Figure 3) to all input terminals/input connector (8) of the power converters corresponding to the output terminals (9) respectively (paragraph 6).

In respect to claim 5, Kondo et al. discloses a plurality of input terminals/input connector of the power converters (paragraph 6) that are provided on the same and one surface (Figure 3).

In regard to claim 10, Kondo discloses in Figure 13 a solar cell module (2) comprising at a power conversion unit/inverter (21) (paragraph 84) and in Figure 2 comprises of having two/plurality of adjacent solar cell elements/solar modules (2) and a power converter/inverter (21) (paragraph 33) provided in a position corresponding to a region/underneath the plane of the solar module (2) as shown in Figure 4 and on the extension of a gap between the two adjacent solar cell modules (2) (Figure 2 and 4) the solar cell modules and power convert are arranged to convert electric power outputted from each solar battery that is attached to each connector (paragraph 6).

In respect to claim 11, Kondo et al. discloses a the solar cell module (1) in Figure 2 according to claim 10, and further discloses a solar cell module/solar battery unit (3) electrically connected to a power conversion unit (21), and discloses in Figure 1, a plurality of the power conversion units (21) which is apart of the ac modules (1) with each power converter/inverter unit (3) (Figure 3) electrically connected (Figure 1) to a power converter/inverter unit (3) of an adjacent power conversion unit (21) (paragraph 6). Kondo et al. has described this particular design as to incorporate an array of solar batter modules and electronic power converters to produce a power generation apparatus (paragraph 1).

With respect to claim 12, Kondo et al. discloses in Figure 11 the solar cell module (1) according to claim 10, wherein outputs of the two adjacent solar cell elements (1) are inputted to the power converters/inverters corresponding to the outputs, and the power converters/inverter convert the inputted outputs of the two adjacent solar cell elements (1) and output/output path (91) the converted outputs (paragraph 76).

In regard to claim 14, Kondo et al. further discloses three power generation units/ (the term power generation unit reads on a solar cell modules attached to a power conversion unit to produce a power generation unit) (1), and each power generation unit/solar cell modules (1) is electrically connected (Figure 4) to a terminal box (21) of an adjacent power generation unit/solar cell modules (1) (paragraph 31).

With respect to claim 16, Kondo et al. discloses a solar cell module (1) in Figure 11, as three of the power generation unit/photoelectric conversion elements and solar module (1) (the term power generation unit reads on a solar cell modules attached to a power conversion unit to produce a power generation unit). Kondo et al. also discloses a power generation unit/solar modules (1) is electrically connected (as shown in Figure 10 and 11) to a terminal box (21) of an adjacent power generation unit/solar module (1) (paragraph 75).

5. Claims 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Takabayashi et al. (US 2002/0195136).

With respect to claim 7, Takabayashi et al. (US 2002/0195136) discloses a solar cell module (Figure 11) and at least one power conversion unit (1303) (as shown in Figure 13) having a plurality of solar cell elements (1102) as shown in Figure 11

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arranged on a plane (1101) and the attachment of a power converter/conditioner (1303) (i.e. converting DC to AC which is an inverter)(paragraph 27) as seen in Figure 11.

Claim 7 reads on the power converter (1303) of Takabayashi et al., which achieves a position as shown in Figure 11 of minimizing a sum of all collecting losses by being the closest to the position of the solar cell array (1303) when collecting a power generated by the solar cell elements to the power converter.

In regard to claim 8, Takabayashi et al. discloses a solar cell module comprising at least one power conversion unit (1303) having a plurality of solar cell elements (1101) arranged on a plane (1103) and a power converter (1303) (i.e. converting DC to AC which is an inverter)(paragraph 27) (as shown in Figure 11-13), wherein the solar cell elements respectively have a terminal member (1104 & 1005) and the power converter (1303) is arranged in the closest position between the terminal members (1104 & 1105) in a state of arranging the solar cell elements (paragraph 21).

With respect to claim 9, Takabayashi et al. (US 2002/0195136) discloses a solar cell module as shown in Figure 11-13 comprising at least one power conversion unit (1303) having a plurality of solar cell elements (1103) shown in Figure 11 and arranged on a plane (1101) and a power converter (1303) (i.e. converting DC to AC which is an inverter)(paragraph 27) as shown in Figure 11, wherein the solar cell elements (1102) respectively have a terminal member (1104 & 1105) as shown in Figure 11 and the power converter (1303) is arranged in the closest position between the terminal members (1104 & 1105) in a state of arranging the solar cell elements as shown in Figure (11) (paragraph 21). Claim 9 reads on the power converter (1303) which

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achieves a position as shown in Figure 11 of minimizing a sum of all collecting losses by being the closest to the position of the solar cell array (1303).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. (US 2002/0038667) in view of Takehara et al. (6,331,670).

In regard to claim 6, Kondo (US 2002/0038667) discloses the solar cell module (1) (paragraph 1) according to claim 1, but fails to disclose the solar cell elements as p-n junctions or pin junctions.

Takehara et al. discloses a photovoltaic/solar cell array (Figure 3) of each of the solar cell elements has p-n junctions (303 a, b, c) or pin junctions of two or more layers (col. 9; lines: 13-23). It is obvious to those skilled in the art to utilize a p-n junction for solar cell elements since their ability to allow current to flow easily in only one direction as evidence given by Jackson et al., **Handbook of Semiconductors Technology**, Vol. 2., Wiley, Copyright 2000, p.348. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the p-n junction as disclosed by Takehara et al. to the power converter in the solar cell module of Kondo (US 2002/0038667) in order to get current to flow.

Response to Arguments

Claim Rejections USC 102(e)

7. With respect to claim 1, the Applicant argues that Yoshikawa et al. (US2002/0193001) does not disclose or suggest a power converter for converting DC-DC or an inverter.

Applicant's arguments have been fully considered and are persuasive. The rejection under 35 U.S.C. 102(e) of claim 1 has been withdrawn.

Claim Rejections USC 102(b)

6. With respect to claim 1, the Applicant has argued that the applied reference of Kondo (6,169,678) does not disclose or suggest a power converter that converts DC-DC or inverter provided in a position corresponding to a region surrounded by a plurality of solar cell elements.

The Examiner respectfully disagrees. Kondo discloses that the power converter provided in a position corresponding to a region surrounded and that the power converter (21) is supplied for converting DC to AC power/inverter (col. 4; lines: 61-64)

With respect to claim 1, the Applicant has argued that the applied reference of Kurokami (5,955,885) is not seen to disclose a specific relationship between a power converter and solar cell elements, much less that a power converter is surrounded by a plurality of solar cell elements.

Applicant's arguments have been fully considered and are persuasive. The rejection under 35 U.S.C. 102(e) as anticipated by Kurokami et al. (5,955,885) of claim 1 has been withdrawn.

With respect to claim 1, the Applicant has argued that the applied reference of Kondo (US 2002/0038667) does not disclose or suggest a power converter that converts DC-DC or inverter provided in a position corresponding to a region surrounded by a plurality of solar cell elements.

The Examiner respectfully disagrees. Kondo et al. (US 2002/0038667) discloses the solar cell module (1) (paragraph 1) according to claim 1, wherein at least two of the power conversion units/inverter(21) (paragraph 33) are included and each power converter/inverter unit (3) (paragraph 36) is in the plane of the solar cell module (1) and electrically connected to a power converter of an adjacent power conversion unit (as shown in both Figure 1 & 2).

7. With respect to claims 7-9, the Applicant has argued that the applied reference of Takabayashi et al. does not show in Figure 13 that the power converter is arranged in a position of minimizing a sum of all collecting losses when collecting a power generated by a plurality of solar cell elements to the power converter.

It is of record in the first office action that the Examiner has used Figure 11 along with Figure 13 to show that Takabayashi et al. has disclosed that the power converter is arranged in the closest position between the terminal members, even so, the Examiner has clarified the rejection to indicate Figure 11 illustrating minimizing a sum of all

collecting losses by being the closest to the position of the solar cell array (1303) when collecting a power generated by the solar cell elements (paragraph 21). Takabayashi also discloses the attachment of a power converter/conditioner (1303) (i.e. converting DC to AC which is an inverter)(paragraph 27) as seen in Figure 11.

8. In regard to claims 10 and 11, the Applicant has argued that the applied reference of Kondo ('667) does not disclose or suggest that the power converter which is a Dc-Dc converter or an inverter is provided in a position corresponding to a region between the two adjacent solar cell elements.

The Examiner respectfully disagrees. In regard to claim 10, Kondo ('667) discloses in Figure 13 a solar cell module (2) comprising at a power conversion unit/inverter (21) (paragraph 84) and in Figure 2 comprises of having two/plurality of adjacent solar cell elements/solar modules (2) and a power converter/inverter (21) (paragraph 33) provided in a position corresponding to a region/underneath the plane of the solar module (2) as shown in Figure 4 and on the extension of a gap between the two adjacent solar cell modules (2) (Figure 2 and 4) the solar cell modules and power convert are arranged to convert electric power outputted from each solar battery that is attached to each connector (paragraph 6).

9. In regard to claim 13 and 15, the Applicant has argued that Kondo ('678) is not seen to disclose a specific relationship between a power converter and solar cell elements, much less that a power converter is surrounded by a plurality of solar cell elements.

The Examiner respectfully disagrees. The Examiner respectfully disagrees. Kondo discloses that the power converter provided in a position corresponding to a region surrounded and that the power converter (21) is supplied for converting DC to AC power/inverter (col. 4; lines: 61-64)

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ASHA HALL whose telephone number is (571)272-9812. The examiner can normally be reached on Monday-Thursday 8:30-7:00PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJH

/A. H./

Examiner, Art Unit 1795